

Claims

1. A self-adjusting deflection controlled roll (10) comprising a rotating roll jacket (12), a carrier (14) passing axially through the roll jacket (12) and held rotationally fixedly at its ends in frames (16) and at least one supporting member (18) arranged at the carrier (14) and exerting a support force on the inner side of the roll jacket in a pressing plane with at least one axial end of the roll jacket (12) or an axial continuation (12') associated with it being rotationally mounted by at least one bearing on a non-rotating axial bearing sleeve (22) of a bearing housing (24) secured against rotation extending into the region between the roll jacket (12) or the axial continuation (12') and the carrier (14), said bearing housing (24) being freely movable relative to the carrier (14) substantially in the pressing plane perpendicular to the roll axis (X), characterized in that the roll jacket (12) is radially supported via the axial bearing sleeve (22) of a respective bearing housing (24) transversely to the pressing force plane and is axially fixed at the carrier (14) at an axial end via guide means (26) provided radially between the bearing sleeve (22) of the relevant bearing housing (24) and the carrier (14) and permitting both a tilting moving and a movement of the bearing sleeve (22) relative to the carrier (14) substantially in the pressing plane perpendicular to the roll axis.
2. A deflection controlled roll in accordance with claim 1, characterized in that the guide means (26) provided radially between the bearing sleeve (22) and the carrier (14) are arranged in an axially central region of the bearing sleeve (22) and/or centered relative to this bearing sleeve (22) in the axial direction.

3. A deflection controlled roll in accordance with claim 1 or claim 2, characterized in that the bearing sleeve (22) is also radially supported at the carrier (14) transversely to the pressing plane via the guide means (26).

Sub A1

4. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that the guide means (26) include at least one guide member (26') rotatably mounted in the bearing sleeve (22) or the carrier (14) about an axis (Y) perpendicular to the pressing plane, said guide member sliding as a follower in a guide (26'') provided at the carrier (14) or at the bearing sleeve (22) and being displaceably guided by this essentially parallel to the pressing plane perpendicular to the roll axis X.

5. A deflection controlled roll in accordance with claim 4, characterized in that the guide means (26) include at least two follower-like guide members (26') provided on mutually opposite sides of the carrier (14) and each cooperating with a guide (26'').

6. A deflection controlled roll in accordance with claim 4 or claim 5, characterized in that the guide (26'') cooperating with a respective guide member (26') is formed at a counter plate (28) secured to the carrier (14) or to the bearing sleeve.

Sub A2

7. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that the guide member (26') is formed by a flange with a collar or the like.

8. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that the roll jacket (12) is axially fixed to the carrier

- (14) at the axial end at the drive side via the guide means (26) associated with a relevant bearing housing (24).
- A2
9. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that the roll jacket (12) is supported radially at the other axial end, preferably at the guide side, at the carrier (14) transversely to the pressing force plane via the axial bearing sleeve (22) of a relevant bearing housing (24), but is axially displaceable relative to it.
10. A deflection controlled roll in accordance with claim 9, characterized in that the bearing sleeve (22) of the relevant bearing housing (24) is radially supported at the carrier (14) via at least two bearing members (30) arranged at mutually opposite carrier sides, said bearing members being respectively rotatably mounted in the bearing sleeve (22) or in the carrier (14) about an axis (Y) perpendicular to the pressing plane.
11. A deflection controlled roll in accordance with claim 10, characterized in that the bearing members (30) respectively rotatably mounted in the bearing sleeve (22) or the carrier (14) about an axis (Y) perpendicular to the pressing plane cooperate with a counter surface which is preferably formed by a counter plate (32) secured to the carrier (14) or to the bearing sleeve (22).
- Sub A3
12. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that at least one piston in cylinder arrangement (34) acting generally in the pressing plane perpendicular to the roll axis (X) is provided radially between the bearing sleeve (22) of a respect bearing housing (24) and the carrier (14).

- Sub A4*
13. A deflection controlled roll in accordance with claim 12, characterized in that at least one piston in cylinder arrangement (34) is provided at the support member side of the carrier (14) and/or at least one piston in cylinder arrangement (34) is arranged at the opposite carrier side.
14. A deflection controlled roll in accordance with claim 12 or claim 13, characterized in that the piston in cylinder arrangement (34) is provided to relieve the roll jacket (12) from the weight forces acting outside the working width of the roll jacket (12) and/or to load or to relieve the respective jacket end in order to influence the pressing force distribution in the press nip by controlled pressure medium loading and/or to fix the roll jacket (12) in place in a position raised from a counter roll by shutting off the pressure medium backflow from the piston in cylinder arrangement (34).
15. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that the bearing sleeve (22) of a respective bearing housing (24) is provided in the region of a carrier spigot (14') narrowed with respect to the axially central region of the carrier (14).
16. A deflection controlled roll in accordance with claim 15, characterized in that the piston in cylinder arrangement (34) is arranged between the narrowed carrier spigot (14') and the bearing sleeve (22).
- Sub A5*
17. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that the piston (34') of the piston in cylinder arrangement (34) acting on the bearing sleeve (22) comprises a relief chamber (36) fed with pressure fluid at its side confronting the bearing sleeve (22).

- Sub A6*
18. A deflection controlled roll in accordance with claim 17, characterized in that the relief chamber (36) is fed via at least one capillary (44).
19. A deflection controlled roll in accordance with claim 17 or claim 18, characterized in that the feeding of the relief chamber (36) takes place via the pressure chamber (42) of the piston in cylinder arrangement (34) and through the piston (34').
20. A deflection controlled roll in accordance with claim 17 or claim 18, characterized in that the feeding of the relief chamber (36) takes place from the side of the bearing sleeve (22).
21. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that the piston (34') of the piston in cylinder arrangement (34) directly contacts the inner side of the bearing sleeve (22).
22. A deflection controlled roll in accordance with any one of claims 1 to 20, characterized in that the piston (34') of the piston in cylinder arrangement (34) contacts a shallow side of an intermediate member (38) arranged between the carrier (14) and the bearing sleeve (22).
23. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that at least one axial end of the roll jacket (12) or the axial continuation (12') associated with this is rotatably mounted at the bearing sleeve (22) by two axially spaced apart bearings (20).

- Sub A7*
24. A deflection controlled roll in accordance with claim 23, characterized in that the two axially spaced apart bearings are each formed by a rolling bearing.
25. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that it is made as a single-zone roll, i.e. at least the support members (18) can be loaded with the same pressure.
26. A deflection controlled roll in accordance with any one of claims 1 to 24, characterized in that it is made as a multi-zone roll, i.e. at least some of the support members (18) can be loaded with different pressures.
27. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that the axial end of the roll jacket (12) at the drive side or the axial continuation (12') associated with it outwardly radially carries a gear ring (48) serving for the roll drive.
28. A deflection controlled roll in accordance with any one of the preceding claims, characterized in that the axial centers of the gear ring (48), of the bearing arrangement (20) rotatably holding the roll jacket (12) at the bearing housing (24), of the guide means (26) and/or of the piston in cylinder arrangement (34) lie substantially in a common plane (E) perpendicular to the roll axis (X)